REMARKS

Claims 10-14 are pending in the present application. Claims 1-9 have been canceled. The amendment to claim 10 is supported by paragraph [0055] of the instant specification. Accordingly, no new matter has been added by these amendments.

Rejection under 35 USC § 103

Claims 10-14 have been rejected under 35 USC § 103 as being obvious over US Patent Application Pub No. 2002/0034686 (Yamakawa '686). This rejection is respectfully traversed. Reconsideration and withdrawal thereof are requested.

The present invention

Applicants have produced an electrode which exhibits excellent smoothness, crack resistance and binding force by using, as a binder, a copolymer obtained by using two monomers. The polymer obtained by homopolymerizing one of the monomers has a glass transition temperature different from that of a polymer obtained by homopolymerizing the other.

More specifically, Applicants are claiming an electric double layer capacitor, comprising an electrode and an electrolyte for the electric double layer capacitor. The electrode layer comprises copolymer (A), and an active material for the electrode that is bonded to a current collector. Copolymer (A) comprises:

1. monomer units derived from at least one compound (a) represented by the following general formula (1):

$$CH_2=CR^1COOR^2 \qquad (1)$$

wherein R^1 represents a hydrogen atom or a methyl group, and R^2 represents an alkyl group or a cycloalkyl group, the glass transition temperature obtained by homopolymerizing compound (a) is less than 0°C, and

2. monomer units derived from at least one compound (b) selected from acrylic acid alkyl esters, methacrylic acid alkyl esters, aromatic vinyl compounds, and α,β-unsaturated nitrile compounds, the glass transition temperature obtained by homopolymerizing the compound (b) is 0°C or higher.

The total content of the monomer units derived from the compound (a) and those derived from the compound (b) is 90% or more by weight per 100% by weight of the whole copolymer (A), and the glass transition temperature of the copolymer (A) is 10°C or lower. Additionally, the electrolyte includes tetraethylammonium tetrafluoroborate, triethylmonomethylammonium tetrafluoroborate, or tetraethylammonium hexafluorophosphate.

Distinction over Yamakawa '686

Yamakawa '686 describes a binder composition which can be used in "a non-aqueous electric double layer capacitor using movement of lithium ion" which means that the capacitor thus described requires the movement of a lithium ion in the capacitor. In general, an electrolyte solution comprises an organic solvent and an electrolyte dissolved in the organic solvent. Thus, the organic solvent is selected from those which can dissolve the electrolyte to be used and is specific to the chosen electrolyte. Similarly, the binder to be used for the electrode of a capacitor is selected with consideration of the resolvability of the binder for the electrolyte solution.

The skilled artisan would recognize that the binder compositions taught by Yamakawa '686 must be customized according to the type of capacitor being used. Since several types of lithium ion secondary batteries are described in Yamakawa '686, the skilled artisan would first need to select the "non-aqueous electric double layer capacitor using movement of a lithium ion" from among the several options, and then would need to optimize the conditions and binder composition according to the nature of that capacitor. There is no motivation for the skilled artisan to use a binder composition suitable for a capacitor which uses the movement of lithium ions, as described in Yamakawa '686, with any other type of electrolyte solutions. Nor is there motivation to use a binder composition suitable for the electrolyte solution as instantly claimed in a capacitor which uses the movement of lithium ions.

Applicants' electric double layer capacitor uses a binder (copolymer (A)) appropriate for the specific electrolyte solution claimed (e.g. an electrolyte including tetraethylammonium tetrafluoroborate, triethylmonomethylammonium tetrafluoroborate, or tetraethylammonium hexafluorophosphate). This type of electrolyte solution is neither disclosed nor suggested by Yamakawa '686 since Yamakawa '686 instead employs lithium ion movement in the electric double layer capacitor. Accordingly, one of ordinary skill in the art would not be motivated to use the binder composition of the instant invention in a capacitor as taught by Yamakawa '686 with any expectation of success since the two would be recognized as incompatible and therefore inoperable together.

Additionally, Applicants note that Yamakawa '686 fails to disclose or suggest the glass transition temperature limitation of the instant claims as well as the specific recited range of weight percent or mole percent of monomer units. The Examiner has asserted that optimizing

the monomer content is an obvious variation of the prior art which is obtained through routine experimentation. However, since the electrolyte to be used in the capacitor of the invention would not be functional in the lithium ion secondary batteries of Yamakawa '686, there would not be motivation to optimize the content of the monomers with any expectation of success.

Yamakawa '686 further fails to appreciate the unexpected and beneficial results seen by Applicants when using the capacitor of the invention. For example, the electrode of the capacitor exhibits excellent smoothness, cracking resistance and binding force. Additionally, the electric double layer capacitor has a small internal resistance coupled with excellent performance. These advantages are not observed in Yamakawa '686. In this regard, see the data presented in Table 2 of the instant specification.

Inasmuch as Yamakawa '686 fails to teach the use of an electrolyte including tetraethylammonium tetrafluoroborate, triethylmonomethylammonium tetrafluoroborate, or tetraethylammonium hexafluorophosphate as instantly claimed, and since the skilled artisan would not be motivated to use the binder of the invention in the lithium ion secondary batteries of Yamakawa '686, Applicants assert that the claimed invention is not obvious over the teachings of Yamakawa '686.

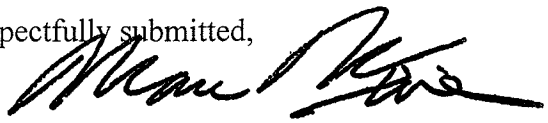
In view of the above amendment, Applicants believe the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Marc S. Weiner, Reg. No. 32,181 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and fu-ture replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Dated: June 29, 2009

Respectfully submitted,



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